



Dart Hawkesbury
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D119-796-141
Job Sheet 162475



Part No: D119-796-141

Job Qty: 1 ea

Part Name: Fwd Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 9/30/17

Job Tracking No:

Due Date: 10/15/17

Created By: Mario Poulin

Type: Stock

Description:

Note: DWG IIN-D119-796 REV F, D119-796-141 REV H IPP REV:A 14.09.03 NEW ISSUE DD VERF:JLM IPP REV:B 14.10.15 AS PER REV.B DD VERF:JLM IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV.pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD

Ship Via:

Bill of Materials

Part/Part Name	Part Note	Serial No	Quantity	Location
D119-796-141 Fwd Crosstube Installation Without Step (No Hardware)	DWG IIN-D119-796 REV F, D119-796-141 REV H IPP REV:A 14.09.03 NEW ISSUE DD VERF:JLM IPP REV:B 14.10.15 AS PER REV.B DD VERF:JLM IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV.pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD		0.000	
CR3212-4-08 Rivet			0.000	
D119-796-141TRN Crosstube Turning Detail	DWG REV H IPP REV A RQ 14/06/06 VERIFIED BY DD IPP REV:B 16.05.04 AS PER DWG REV.H DD VERF:JLM		0.000	
D2873-043 Nut Plate Assembly	DWG REV A IPP A 05.09.13 New issue KJ/JLM		0.000	
D5123-3 Clamp Cushion	DWG REV D IPP REV:A NEW ISSUE 14-08-28 JLM VERIFIED REV:B 16-11-11 AS PER DWG REV.D DD VERF:JLM			
D5124-1 Fwd Support	DWG REV B IPP rev A RQ verified by JLM 14/08/08			
D5152-041 Fwd Post Mount Assembly	DWG REV B SHEET 1 IPP REV:A 15.01.09 NEW ISSUE DD \			
D5305-1 Shim	DWG REV A IPP REV:A 15.09.04 NEW ISSUE DD VERF			
MS21920-24 Clamp				

Status: Stock

Part: **D119-796-141 B162475**

Created: 9/30/17 11:13 AM DART.MICHAUD-FEBRILLE.VICTORIA



Serial No: **S000037**

Printed By: Goldston, Justin 10/2/17 10:44 AM

Job Routing

Op No	Operation	Qty	Due Date	Standard		Workcenter/Supplier	
				Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time
90	Start up Operation	1 Ea	10/13/17	0.00	0.00	Start up container	
110	DC	1 pcs	10/13/17	0.00	0.00	DC	
170	QC Deleted	1 pcs	10/14/17	0.00	0.00		
230	SprayPaint	1 pcs	10/14/17	0.00	0.93	Spray Paint	NOV 09 2017
240	QC	1 pcs	10/14/17	0.00	0.00	QC14	
242	Crosstubes	1 pcs	10/14/17	0.00	2.50	Crosstube	NOV 20 2017
244	QC	1 pcs	10/14/17	0.00	0.00	QC5	
246	SprayPaint	1 pcs	10/14/17	0.00	0.93	Spray Paint	NOV 11 2017
248	SprayPaint	1 pcs	10/14/17	0.00	0.93	Spray Paint	NOV 17 2017
250	QC	1 pcs	10/14/17	0.00	0.00	QC14	

DART
AEROSPACE
S008479

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Email: sales@dartaero.com
www.dartaerospace.com



Fwd Crosstube Installation Without Step (No Hardware)

PART NO: D119-796-141

Revision:

Operation: Start up Operation

Change No:

Mfg Date: 11/09/17

Job No: 162475

252	Crosstubes	1 pcs	10/15/17	0.00	2.50	Crosstube	AP
260	QC	1 pcs	10/15/17	0.00	0.00	QC5	
290	Packaging	on w/o 165726	1 pcs	10/15/17	0.00	0.00	Packaging3 AL NOV 23 2017
300	QC21-FG	1 Ea	10/15/17	0.00	0.00	QC21	on w/o 165726

Part Op 110 - Photocopy bluefile and create labels as per PPP D119-796-141 chg 004

Descriptions: 230 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ ***VERIFY BY _____ PART # _____
 TO MATCH W/O _____ ***MASK SCRIBE B# & P# AND VERIFY*** 1- Prime Inside of tube. 2- Install nut plates as per dwg (D2873-043) 3- Mask cuffs per note#2. 4- Prime exterior of tube per QSI005. Primer
 Batch: _____ Start Time: _____ Finish Time: _____
 240 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
 242 - Assemble as per dwg D119-796-141 and Qsi 015 1- Abrade mating surfaces with Scotch Brite 7447 and clean with Dupont 4105s or equivalent as per dwg. 2- Install D5152-041 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10089 (identified right and left) *****MAINTAIN CLAMPING PRESSURE ON FOR MIN 72HRS*****
 Proseal Batch: _____ EXP: _____ PROSEAL CURE TIME 72 HOURS: _____
 Start: _____ Finish: _____ 3- Install support and shim using proseal 890 per dwg and clamp in position.
 244 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
 246 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ 1- Remove all non-fixed hardware and clean any excess proseal. 2- Scuff tube with Scotch Brite 7447. 3- Mask cuff per note#2. 4- Prime as per dwg and QSI005 5- Apply matte clear as per dwg and QSI005 Clear Batch: _____
 248 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ 1- Mask underside of tube as per dwg. Mask cuff per note#2. 2- Scuff tube with Scotch Brite 7447 3- Paint outside of crosstube Paint
 Batch: _____
 250 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
 252 - 1- Re-install non fixed hardware per dwg ***Torque all clamps to 80-100 IN-LBS.*** 2- Apply a filet-seal of proseal 890 around supports. Allow proseal to dry before inspecting. Proseal 890 Batch: _____
 EXP: _____ PROSEAL CURE TIME 72 HOURS: Start: _____
 Finish: _____
 260 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED AS PER DWG.*** ***VERIFY BY _____ BATCH # TO MATCH W/O _____
 290 - Identify and pack for shipping as per PPP D119-796-141

Primer 138646 Paint 138637
 Clear 136205 Proseal/Scotchfield see old w/o

Job BOM

Part / Item	Component Name	Quantity	Operation	Special Comments
D119-796-141 B162475		1 Ea (1 ea)	90-Start up Operation	
D2873-043	Nut Plate Assembly	4 Ea (4 ea)	242-Crosstubes	
D5123-3	Clamp Cushion	4 Ea (4 ea)	242-Crosstubes	
D5124-1	Fwd Support	2 Ea (2 ea)	242-Crosstubes	
D5152-041	Fwd Post Mount Assembly	2 Ea (2 ea)	242-Crosstubes	
D5305-1	Shim	2 Ea (2 ea)	242-Crosstubes	
MS21920-24	Clamp	4 Ea (4 ea)	252-Crosstubes	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D119-796-141 B162475	1	1	0	0
242-Crosstubes	D2873-043	4	0	0	0
	D5123-3	4	0	0	0
	D5124-1	2	0	0	0
	D5152-041	2	0	0	0
	D5305-1	2	0	0	0
252-Crosstubes	MS21920-24	4	0	0	0

Part Specifications

Specifications could not be found.

Work Order Summary

Thursday, September 28, 2017 9:01:21 AM

Page 1 of 2

Criteria : Work Order ID: 162475 Item ID: D119-796-141 Product Family CROSSTUBES
Work Order Start Dates 6/7/2017 to 6/7/2017 11:59:59 PM Work Order Required Dates 7/4/2017 to 7/4/2017
11:59:59 PM

All References

Work Order Status Released

Work Order ID	162475	Required Qty	1.0000	Status Code	Released
Item ID	D119-796-141	Accepted Qty	0.0000	Scrap Qty	0.0000
Item Name	FWD Crosstube Installation without Step (no hardware)				
Current Acct Value	\$3,516.133				
Start Date	6/7/2017	Required Date	7/4/2017	Completed Date	
Standard	** Actual **		** Acct. Value **	** Variance **	** Variance % **
Direct Costs	Total	Each	Each	Each	Each
Material	\$333.554	\$0.000	\$520.291	\$520.291	100.00%
Labor	\$291.032	\$0.000	\$867.198	\$867.198	100.00%
Outplant	\$88.744	\$0.000	\$98.221	\$98.221	100.00%
Variable Burden	\$0.000	\$0.000	\$0.000	\$0.000	0.00%
Fixed Burden	\$948.705	\$0.000	\$2,697.072	\$2,697.072	100.00%
Material Burden	\$0.000	\$0.000	\$0.000	\$0.000	0.00%
** Total **	\$1,662.034	\$0.000	\$4,182.781	\$4,182.781	

Item ID/Item Name		Required Qty	Issue Code	Issue Date	Issued Qty	Cost Amount
PO ID	PO Line Nbr	PO Receiver Date	Domestic Unit Price	PO Receipt Qty	Domestic Received Amt	Certification Standard
CR3212-4-08						
RIVET						
PO Rout Seq ID		PO Vendor ID	VC-SKY001	9/10/2017	16.0000	\$10.643
D119-796-141	13	9/5/2017 3:25:00 PM	\$88.7441	1.0000	\$88.744	m138455
Crosstube Turning Detail			1.0000	8/24/2017	1.0000	\$871.628
D2873-043			4.0000	9/10/2017	4.0000	\$103.669
Nut Plate Assembly						
Total Matl Amts:						\$985.940

Invoice Rout Seq ID		Invoice Vendor ID		VC-SKY001		
Invoice ID	Invoice Line Nbr	Invoice Date	Invoice Unit Price	Invoice Qty	Invoice Amt	
MWQ32982	12	9/5/2017 1:01:34 PM	88.744125	1.0000	\$88.744	

Work Center CNC Bend 2

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
grou01												
	8/24/2017											
130			1.77	0.89	0.00	0.00	2.00	\$16.462	\$0.000	\$54.267	\$0.000	\$70.729
paul01												
	7/6/2017											
130			2.53	0.63	0.00	0.00	4.00	\$11.765	\$0.000	\$38.781	\$0.000	\$50.546

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Work Order Summary

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8/24/2017												
130			0.00	0.00	1.44	1.44	1.00	\$0.000	\$26.816	\$88.396	\$0.000	\$115.213
whit01												
8/24/2017												
130			0.00	0.00	1.44	1.44	1.00	\$0.000	\$26.822	\$88.415	\$0.000	\$115.237
Total:			4.30	1.52	2.89	2.89	8.00	\$28.227	\$53.638	\$269.859	\$0.000	\$351.724

Work Center Crosstubes

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
pain01												
8/28/2017												
150			0.45	0.11	0.00	0.00	4.00	\$2.097	\$0.000	\$6.911	\$0.000	\$9.007
paul01												
8/28/2017												
145			0.00	0.00	6.00	1.50	4.00	\$0.000	\$27.875	\$91.886	\$0.000	\$119.761
Total:			0.45	0.11	6.00	1.50	8.00	\$2.097	\$27.875	\$98.797	\$0.000	\$128.769

Work Center HandFXtube

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
pain01												
8/29/2017												
160			0.00	0.00	0.62	0.62	1.00	\$0.000	\$11.474	\$37.822	\$0.000	\$49.296
Total:			0.00	0.00	0.62	0.62	1.00	\$0.000	\$11.474	\$37.822	\$0.000	\$49.296

Work Center SprayPaint

Employee ID	Rout Seq ID	Labor Date	Setup Hours	Actual Setup Hours	Labor Hours	Actual Labor Hours	Nbr of WOs	Setup Amount	Labor Amount	Fix Burd Amount	Var Burd Amount	Total Amounts
SHEL02												
9/10/2017												
230			0.00	0.00	2.88	0.72	4.00	\$0.000	\$13.398	\$44.165	\$0.000	\$57.562
Total:			0.00	0.00	2.88	0.72	4.00	\$0.000	\$13.398	\$44.165	\$0.000	\$57.562

Work Order ID 162475

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162475

Page 1

Item ID: D119-796-141

Accept

N9000040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: FWD Crosstube Installation without Step (no hardware)

Start Date: 6/7/2017 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 7/4/2017 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:

Process Plan: 

Date: 20170607 Tooling:

Date:

Run Start ***NR1***

QC:

Date: SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
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D119-796-141	H
--------------	---

IIN-D119-796	F
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110

Document Control

0.00

110

DC

Memo

0.02

Doc.Control -USB or Paperwork

Photocopy bluefile and create labels as per PPP D119-796-141 chg 004

120

Pick Kit

0.00

120

Packaging

Packaging

Memo

0.02

Packaging

DAS
47
9-89

17.08-24

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																						
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Large Fab ☐	Composite ☐	Supplier ☐																							
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																		
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																	
Root Cause		FAULT CATEGORY																							
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐		Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐		Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐		Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐																	
		OTHER : ☐																							

Work Order ID 162475

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162475

Page 2

Item ID: D119-796-141 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: FWD Crosstube Installation without Step (no hardware)
Start Date: 6/7/2017 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/4/2017 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 *130* CNC Bend 2 CNC Alpha 160 Bender	BENDING MACHINE - CROSSTUBES Memo Bend tube as per Dwg D119-796-141 using CNC bender program	1.63 0.94				1	Ø		DAS 47 9-89 17-08-24
140 *140* QC Quality Control	QC15- Crosstube Dimensional Check Memo	0.00 0.02							DAS 9 9-89 Ø 17-08-25
145 *145* Crosstubes Crosstubes	Memo 1- CUT TUBE AT HEIGHT ON FAI SHEET 2- VERIFY HEIGHT: 21.62 BY QC15 LEVEL INSPECTOR: 3- DEBURR CUT SURFACE	0.00 1.86							DPZ 17-08-28 DAS 47 9-89

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐	
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																						
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GP 17 08 28

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																													
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Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																																																									
Root Cause		FAULT CATEGORY																																																															
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	Past Expiry Date ☐	Manufacturing Process ☐	OTHER :			
Misidentified ☐	Past Due ☐																																																																

Work Order ID 162475

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162475

Page 4

Item ID: D119-796-141 Accept ***N9000040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: FWD Crosstube Installation without Step (no hardware)
Start Date: 6/7/2017 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/4/2017 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160	Crosstubes Chemical Conversion	0.00							
160									
HandFXtube	Memo	1.54							
Hand Finishing Crosstubes	1- INSPECT AND REMOVE ALL MARKS FROM TUBE WITHIN LIMITS ON DWG D119-796-141								
	IMMEDIATELY AFTER GRINDING								
	2- PRESSURE WASH X-TUBE INSIDE AND OUT								
	3- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.								
	4- Verify grinding marks By: DP2 17-08-30								
175	QC7-Inspect Chemical Conversion Coat	0.00							
175									
QC	Memo	0.02							
Quality Control									

GP 17-08-29
TW

17-08-30 DP2

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																													
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																																																										
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																																																									
Root Cause		FAULT CATEGORY																																																															
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____			
Misidentified ☐	Past Due ☐																																																																

Work Order ID 162475

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Page 5

Item ID: D119-796-141 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: FWD Crosstube Installation without Step (no hardware)
Start Date: 6/7/2017 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/4/2017 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 *180* Outsource2 Outsource process - NDT	Outsource process - NDT per QSI038 4.1 Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038Or Issue P/O: 37609 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00 120.00				1	SEP 05 2017		DAS 13 9-89
190 *190* Packaging Packaging	Pick Kit Packaging Memo Ensure copy of NDT results attached to work order.	0.00 0.02							1x SPRT-9-5.
200 *200* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D119-796-141	0.00 0.02							@ 11.09.05 DAS 9 9-89

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																													
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval																																																										
Description Work Order Deviation				Disposition				Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval																																																									
Root Cause		FAULT CATEGORY																																																															
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____			
Misidentified ☐	Past Due ☐																																																																

Work Order ID 162475***162475***

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Item ID: D119-796-141

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: FWD Crosstube Installation without Step (no hardware)

Start Date: 6/7/2017 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 7/4/2017 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

Spray Painting per QSI005 4.2

0.00

230

SprayPaint

SprayPaint

1.36

Spray Painting

Memo

***VERIFY BY _____ BATCH # TO MATCH W/O

***VERIFY BY _____ PART # TO MATCH
W/O _____

MASK SCRIBE B# & P# AND VERIFY

1- Prime Inside of tube.

2- Install nut plates as per dwg (D2873-043)

3- Mask cuffs per note#2.

4- Prime exterior of tube per QSI005.

Primer Batch: _____

Start Time: _____

Finish Time: _____

Work Order ID 162475

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Item ID: D119-796-141

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: FWD Crosstube Installation without Step (no hardware)

Start Date: 6/7/2017 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 7/4/2017 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

240

QC14- Inspect Spray Paint

0.00

240

0.02

QC

Memo

Quality Control

***VERIFY BY _____ BATCH # TO MATCH W/O

***VERIFY BY _____ PART # TO MATCH
W/O _____

Work Order ID 162475

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162475

Page 8

Item ID: D119-796-141 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: FWD Crosstube Installation without Step (no hardware)
Start Date: 6/7/2017 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/4/2017 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

242

0.00

242

Crosstubes

Crosstubes

Memo

1.08

Assemble as per dwg D119-796-141 and Qsi 015

1- Abrade mating surfaces with Scotch Brite 7447 and clean with Dupont 4105s or equivalent as per dwg.

2- Install D5152-041 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10089 (identified right and left)

****MAINTAIN CLAMPING PRESSURE ON FOR MIN 72HRS****

Proseal Batch: **138408**EXP: **2/18**

PROSEAL CURE TIME 72 HOURS:

Start: **17-10-17 11:00 17-10-17**Finish: **17-10-20**

3- USE DT10304 PINS TO LOCATE SUPPORTS. Install support and shim using proseal 890 per dwg and clamp in position.

Proseal Batch: **138408**EXP: **2/18**

PROSEAL CURE TIME 72 HOURS:

Start: **17-10-23 23**Finish: **17-10-24 26****1****17-10-23**

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162475

Page 9

N900040100

Setup Start *NS1*

Stop *NS2*

Cust Item ID:

Start Date: 6/7/2017 **Start Qty:** 1.00 ***1***

Required Date: 7/4/2017 Req'd Qty: 1.00 * 1 *

Customer:

Reference:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/
Work Center ID

Operation Description

Set Up/ Run Hours

Tool ID**Tool #****Plan
Code**

Accept
Qty

Reject
QtyReject
Number

**Insp.
Stamp**

244

QC5- Inspect part completeness to step on W/O

0.00

244

0.02

QC

Memo

***VERIFY BY _____ BATCH # TO MATCH W/O _____

***VERIFY BY _____ PART # TO MATCH

W/O _____

Quality Control

Work Order ID 162475

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162475

Page 10

Item ID: D119-796-141 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: FWD Crosstube Installation without Step (no hardware)
Start Date: 6/7/2017 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 7/4/2017 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
246	Spray Painting per QSI005 4.2	0.00							

246

SprayPaint

Spray Painting

Memo

0.33

***VERIFY BY _____ BATCH # TO MATCH W/O

***VERIFY BY _____ PART # TO MATCH
W/O _____

MASK SCRIBE B# & P# AND VERIFY

1- Remove all non-fixed hardware and clean any excess pro seal.

2- Scuff tube with Scotch Brite 7447.

3- Mask cuff per note#2.

4- Prime as per dwg and QSI005

Primer Batch: _____

Start Time: _____

Finish Time: _____

5- Apply matte clear as per dwg and QSI005

Clear Batch: _____

Start Time: _____

Finish Time: _____

Work Order ID 162475

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162475

Page 11

Item ID: D119-796-141**Accept*****N900040100*****Setup Start *NS1*****Revision ID:****Stop *NS2*****Item Name:** FWD Crosstube Installation without Step (no hardware)**Start Date:** 6/7/2017 **Start Qty:** 1.00 ***1*****Cust Item ID:****Required Date:** 7/4/2017 **Req'd Qty:** 1.00 ***1*****Customer:****Reference:****Approvals:** **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____**Run Start *NR1*****QC:** _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____**Stop *NR2*****Sequence ID/
Work Center ID****Operation
Description****Set Up/
Run Hours****Tool ID****Tool #****Plan
Code****Accept
Qty****Reject
Qty****Reject
Number****Insp.
Stamp**

248

Spray Painting per QSI005 4.2

0.00

248

SprayPaint

Memo

0.00

Spray Painting

***VERIFY BY _____ BATCH # TO MATCH W/O

***VERIFY BY _____ PART # TO MATCH
W/O _____

MASK SCRIBE B# & P# AND VERIFY

1- Mask underside of tube as per dwg. Mask cuff per note#2.

2- Scuff tube with Scotch Brite 7447

3- Paint outside of crosstube

Paint Batch: _____

Start Time: _____

Finish Time: _____

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W/O _____

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Proseal 890 Batch: _____
EXP: _____Proseal 890 Batch: _____
EXP: _____

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Quality Control

Stop *NR2*

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162475

D119-796-141

Start Date: 6/7/2017

Required Date: 7/4/2017

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 14.09.03 NEW ISSUE DD VERF:JLM IPP
REV:B 14.10.15 AS PER REV.B DD VERF:JLM IPP REV:C
14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12
AS PER REV.pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER
REV F JLM VERIFIED BY:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D5305-1		Manufactured	No			242	Each	15.0000	2	2			
D5305-1		(163387)						2	**			ST.	17-10-23
Shim													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG056				15					
					155334			15					
D119-796-141TRN		Manufactured	No	B161735		120	Each	0.0000	1				
D119-796-141TRN									**			DP2	17-08-24
Crosstube Turning Detail													
D2873-043		Manufactured	No			230	Each	97.0000	4	4			
D2873-043									**			DAS	
Nut Plate Assembly												41	
												SEP 10 2017	
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				LG050	162854			97				4	
					155504			5					
					156196			29					
					159540			30					
					161520			33					

Picklist Print

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Work Order ID: 162475

162475

Parent Item: D119-796-141

D119-796-141

Parent Item Name: FWD Crosstube Installation without Step (no hardware)

Start Date: 6/7/2017

Required Date: 7/4/2017

Start Qty: 1.00

Required Qty: 1.00

D5123-3 Manufactured No

242 Each 586.0000 4 4

D5123-3

Clamp Cushion

**

17-10-17 *DX*

Location Loc Qty Loc Code

LG052 200

160079 200

LG054 386

153233 386

D5124-1 Manufactured No

242 Each 20.0000 2 2

D5124-1

Fwd Support

**

17-10-17 *DX*

Location Loc Qty Loc Code

LG054 20

152391 3

155857 8

156455 9

D5152-041 Manufactured No

242 Each 6.0000 2 2

D5152-041

Fwd Post Mount Assembly

163422

**

2 17-10-18 *DX*

Location Loc Qty Loc Code

LG055 6

154801 6

CR3212-4-08 Purchased No

230 Each 198.0000 16 16

CR3212-4-08

RIVET

**

DAS
41
9-89 SEP 10 2017

Location Loc Qty Loc Code

LG056 198

m136442 98

m137587 100

16

Picklist Print

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Work Order ID: 162475

162475

Parent Item: D119-796-141

D119-796-141

Parent Item Name: FWD Crosstube Installation without Step (no hardware)

Start Date: 6/7/2017

Required Date: 7/4/2017

Start Qty: 1.00

Required Qty: 1.00

MS21920-24

MS21920-24

Clamp

Purchased

No

137963

252

Each

45.0000

4

4

**

4

17-10-17 21-

Location

Loc Qty

Loc Code

FG

2

117998

2

LG050

43

m136016

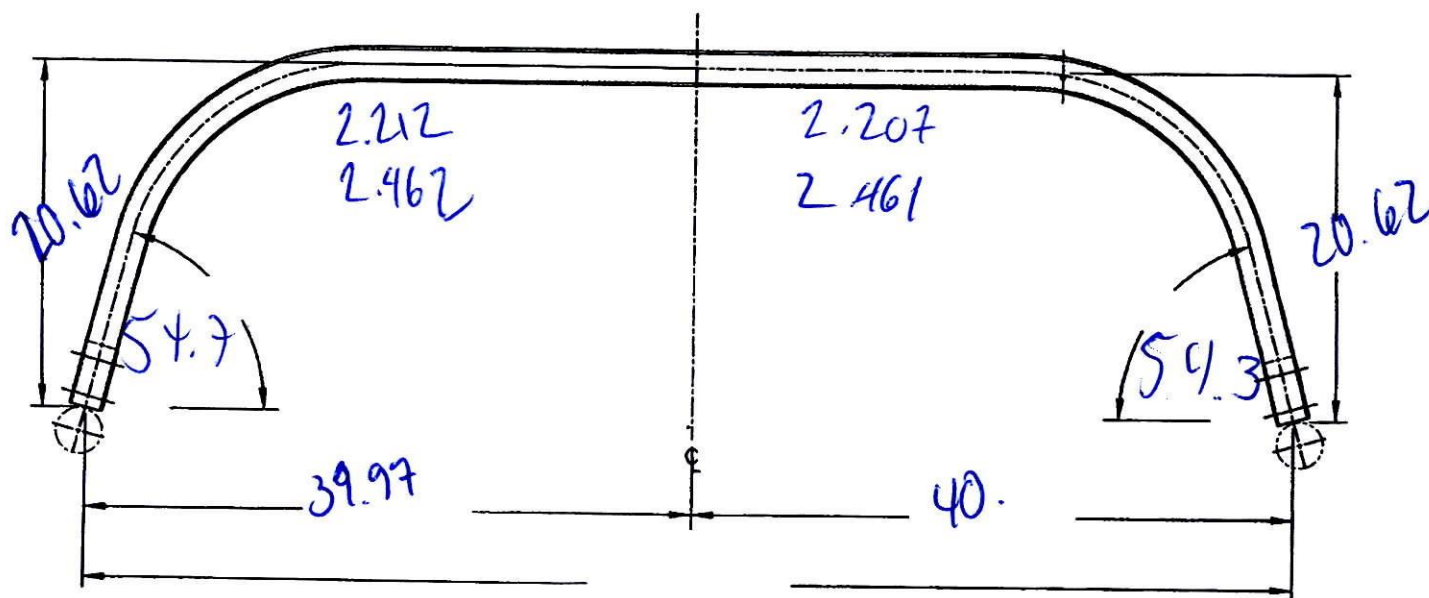
19

m136986

24

DART AEROSPACE LTD		Work Order:	1162475
Description: Crosstube Fwd, with Step		Part Number:	D119-796-141
Inspection Dwg: D119-796-141 Rev: H		Page 1 of 1	

Required Dimension	Min	Max
Height	21.490	21.750
1/2 Span	39.820	40.080
Angle	54°	57°
Total Span	79.640	80.160
Bending Passes	8	--
Crushing	--	6.8%



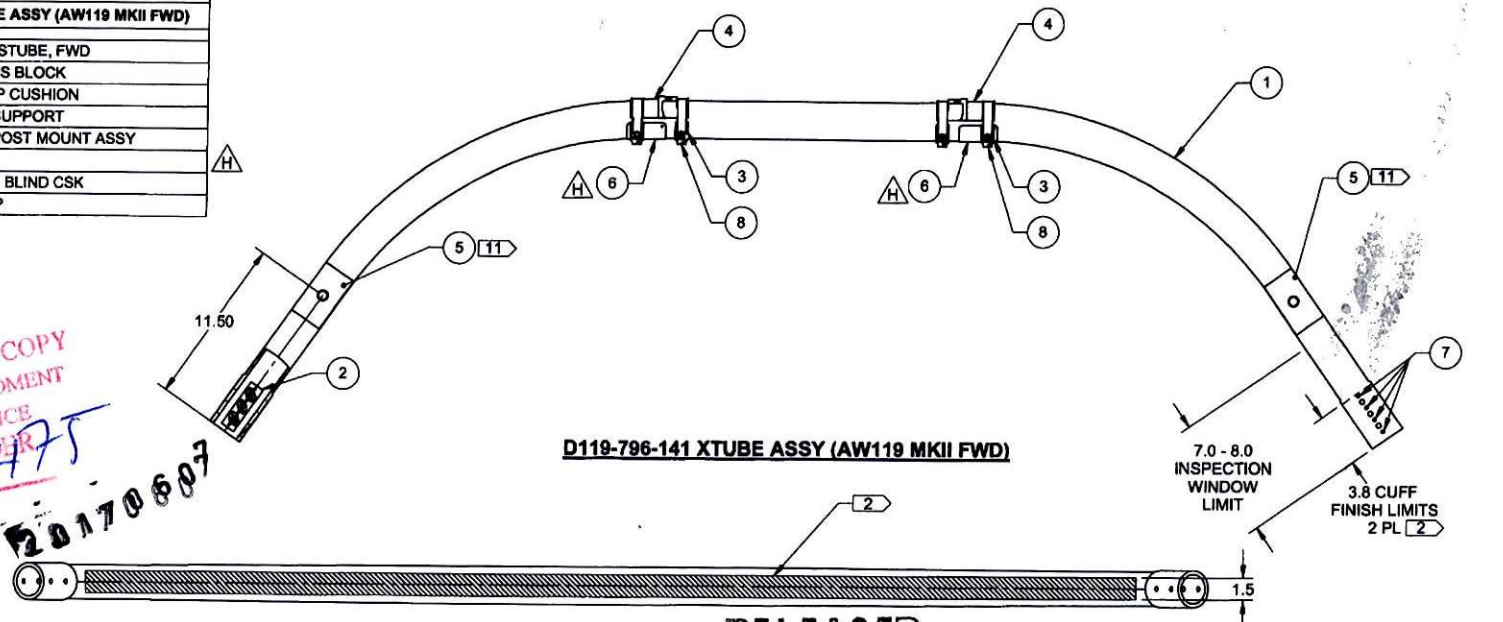
	Side A	Side B
Bending Passes	8	8
Crushing	5.4%	5.4%
Comments		

QC15 Inspection	DAS
Date	9-89 12-08-25

Rev	Date	Change	Revised by	Approved
A	15.04.14	New Issue	KJ	
B	15.11.12	Dwg Rev updated	KJ	
C	16.01.15	Dwg Rev updated	KJ	up

ITEM	QTY	P/N	DESCRIPTION
	X	D119-796-141	XTUBE ASSY (AW119 MKII FWD)
1	1	D119-796-141BND	CROSSTUBE, FWD
2	4	D2873-043	RADIUS BLOCK
3	4	D5123-3	CLAMP CUSHION
4	2	D5124-1	FWD SUPPORT
5	2	D5152-041	FWD POST MOUNT ASSY
6	2	D5305-1	SHIM
7	16	CR3212-4-08	RIVET, BLIND CSK
8	4	MS21920-24	CLAMP

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 162 475
P.2
20170607



RELEASED
2015-11-04
EUN-15-142

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: APPLY MATTE CLEAR COAT PER QSI 005 4.2
MASK D5124-1 FWD SUPPORTS, D5305-1 SHIMS AS WELL AS UNDERSIDE OF CROSSTUBE AS SHOWN (B3-1, HATCHED AREA),
PAINT OUTSIDE PER DART QSI 005 4.2 AFTER APPLYING CLEAR COAT
DO NOT APPLY FINISH (PAINT OR CLEAR COAT) TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY USING PART NUMBER "D119-796-141" AND BATCH NUMBER ON INSIDE OF CUFF PER QSI 044 6.4
- 7) WEIGHT: 18.54 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE.
THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS.
DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 9) PRIOR TO FINISHING, ABRASE MATING SURFACES OF D5124-1 FWD SUPPORTS AND CROSSTUBE WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. APPLY A 0.1 MIN THK LAYER OF PROSEAL 890 ON THE INSIDE CONCAVE SURFACE OF THE D5124-1 FWD SUPPORTS AND INSTALL AT AN 8.4" OFFSET FROM THE CROSSTUBE BENDING PLANE. INSTALL THE MS21920-24 CLAMPS AND D5123-3 CLAMP CUSHIONS WHILE WET.
- 10) TORQUE MS21920 CLAMPS 80 - 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY, THE NUT IS FACING AFT AND HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.
- 11) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5152-041 WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5152-041 WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. LOCATE D5152-041 USING TOOL DT10089.
- 12) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5305-1 SHIM WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH'N'WIPE DEGREASER. INSTALL D5305-1 SHIM WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.1 MIN THK. USE ADDITIONAL TEMPORARY MS21920-24 CLAMP TO APPLY CLAMPING PRESSURE FOR 72 HOURS.

H	ADD D5305-1 SHIM, D6024-103 WAS D6005-103, D5124-1 NOW INSTALLED ON PRIMER	AP	15.10.13
G	FINISHING ORDER ADJUSTED, CR3212-4-08 WAS -07, CUFF DIA TOLERANCE INCREASED TO +/- 0.005	AP	15.04.24
F	REMOVED PRIME/ PAINT ON CUFFS, 2.516 WAS 2.500 (C8-5)	AP	15.02.03
E	D5152-041 FWD STEP POST ASSY WAS D5150-1 STEP POST, SCOTCH BRITE 7447 RED WAS 180 GRIT SANDPAPER, ANGLE (B7-2) DIMENSIONED FROM NEW DATUM	DB	15.01.15
D	ADD D5150-1 STEP POST (2X), MOVED INSPECTION WINDOW DETAIL TO SHEET 1, MODIFIED NOTES ON SHT 1 & 3	DB	14.11.25
C	CR3212-4-07 RIVETS WERE CR3212-4-09, 7.5 DEG CUFF ANGLE OFFSET REMOVED (SHT 3), CUFF DIAMETER ON D119-796-141TRN REDUCED TO 2.500, ADDED INSPECTION WINDOW (B7-3), ADDED SHT 4	AP	14.10.23
B	ADDED D2873-043 RADIUS BLOCK, CR3212-4-09 RIVETS, ADDED SKIDTUBE REFERENCE FOR LOCATING CUFF HOLES, RE-ORGANIZED NOTES AND REMOVED REDUNDANT INFORMATION	AP	14.09.02
A	NEW ISSUE	AP	14.08.09
REV.	DESCRIPTION	BY	DATE
DESIGN	AP		
DRAWN	AP		
CHECKED	AJS		
MFG. APPR.	JLM		
APPROVED	WM		
DE APPR.	DS		
DATE	15.10.13		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

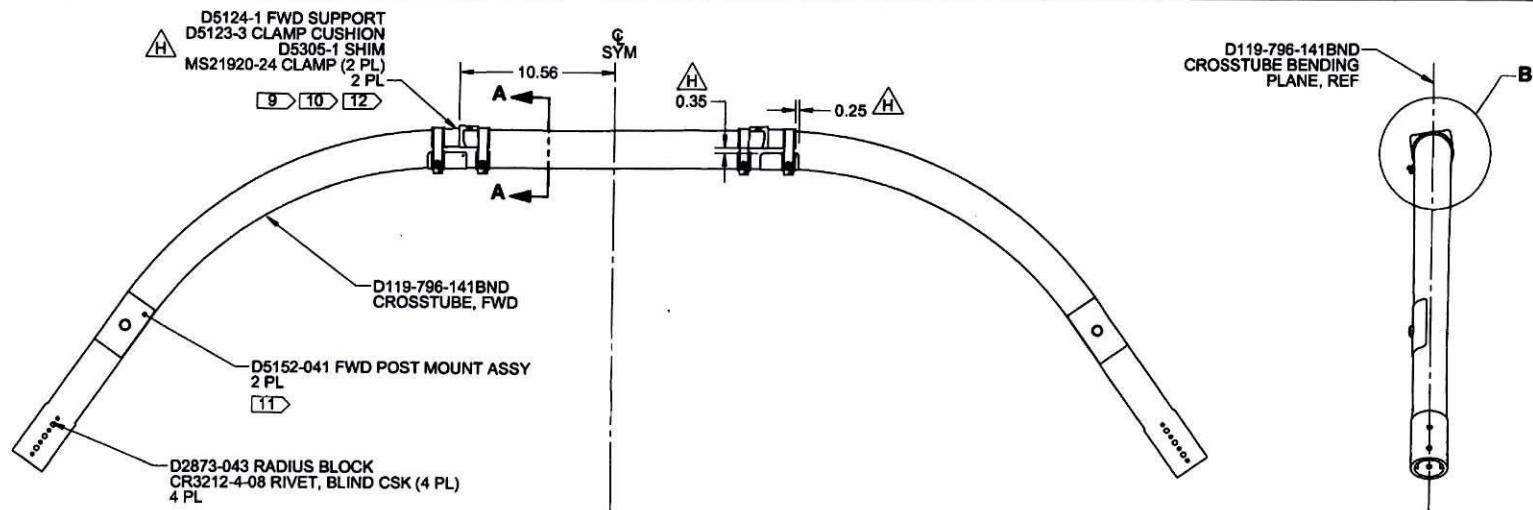
DRAWING NO.
D119-796-141

REV. H
SHEET 1 OF 6

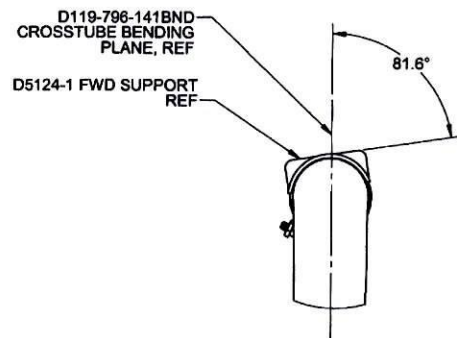
TITLE
XTUBE ASSY (AW119 MKII FWD)

SCALE
NTS

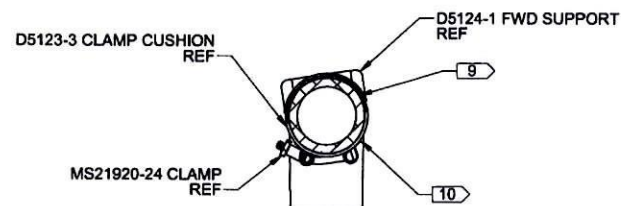
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D119-796-141 XTUBE ASSY (AW119 MKII FWD)



DETAIL B
SCALE 2X

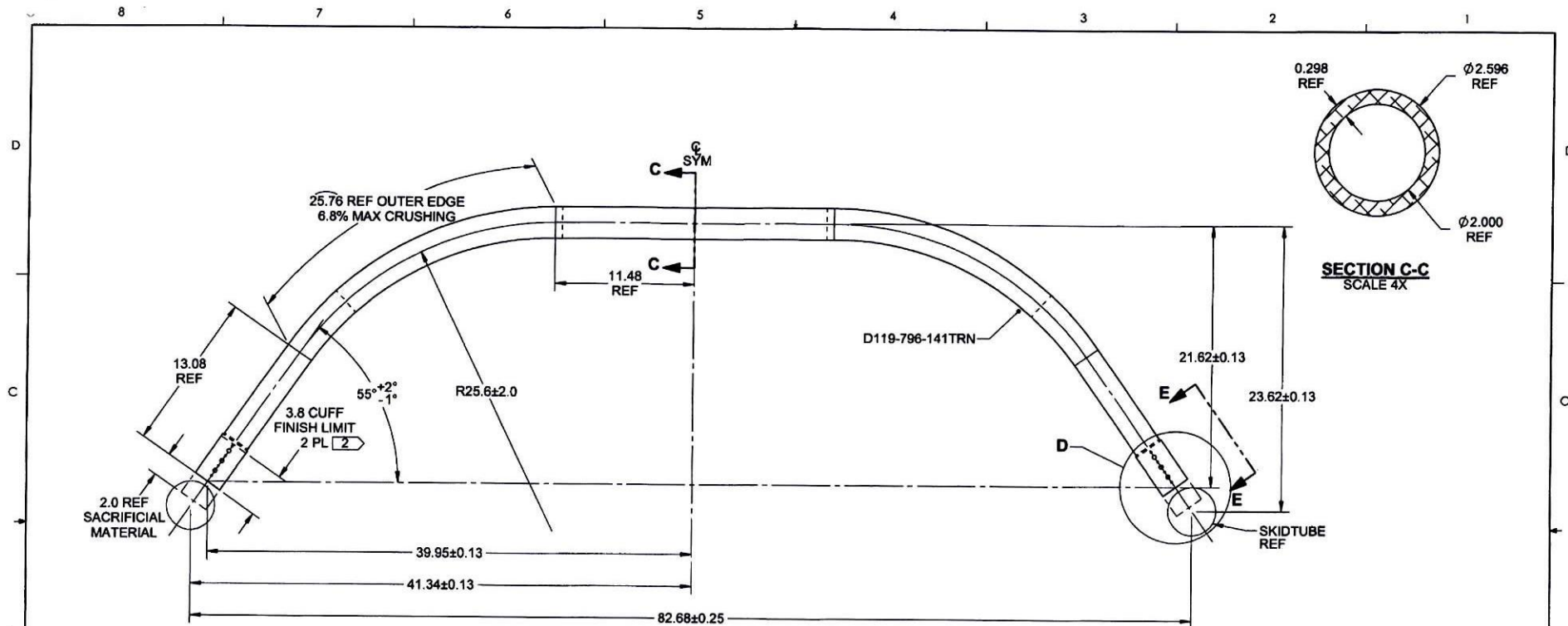


SECTION A-A
SCALE 2X

RELEASED
2015-11-04

APPROVED

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DRAWN	AP		
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 2 OF 6
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII FWD)	NTS
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D119-796-141BND CROSSTUBE, FWD 9
BENDING AND DRILLING DETAIL

NOTES:

- 1) MATERIAL: MADE FROM D119-796-141TRN
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
DO NOT APPLY PRIMER TO CUFFS IN LOCATION SHOWN, MASK PRIOR TO FINISHING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 16.70 lbs
- 8) PART IS SYMMETRICAL ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6.8% BASED ON OD.
- 10) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

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2015-11-04

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DRAWN	AP	HAWKESBURY, ONTARIO, CANADA	
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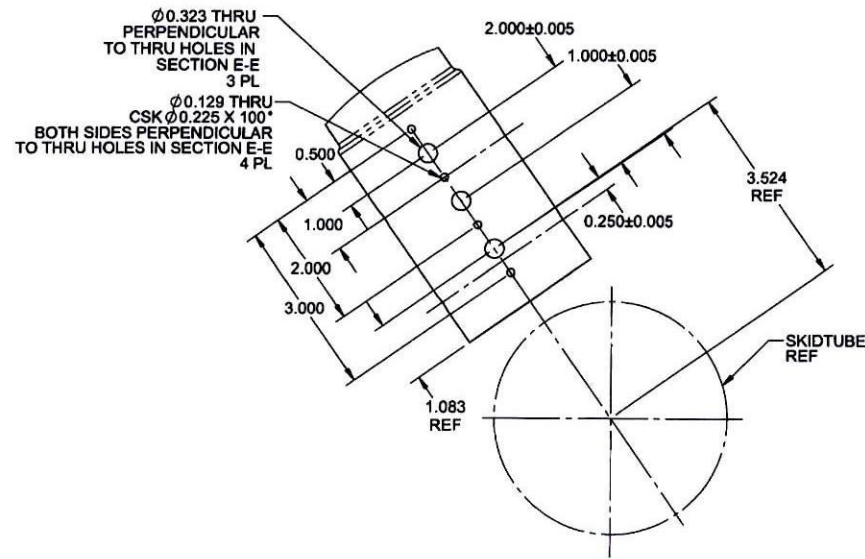
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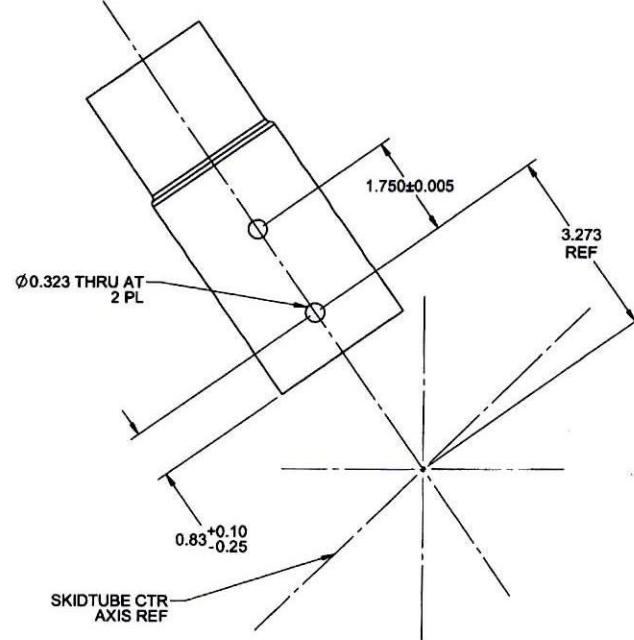
C

B

A



VIEW D
SCALE 4X



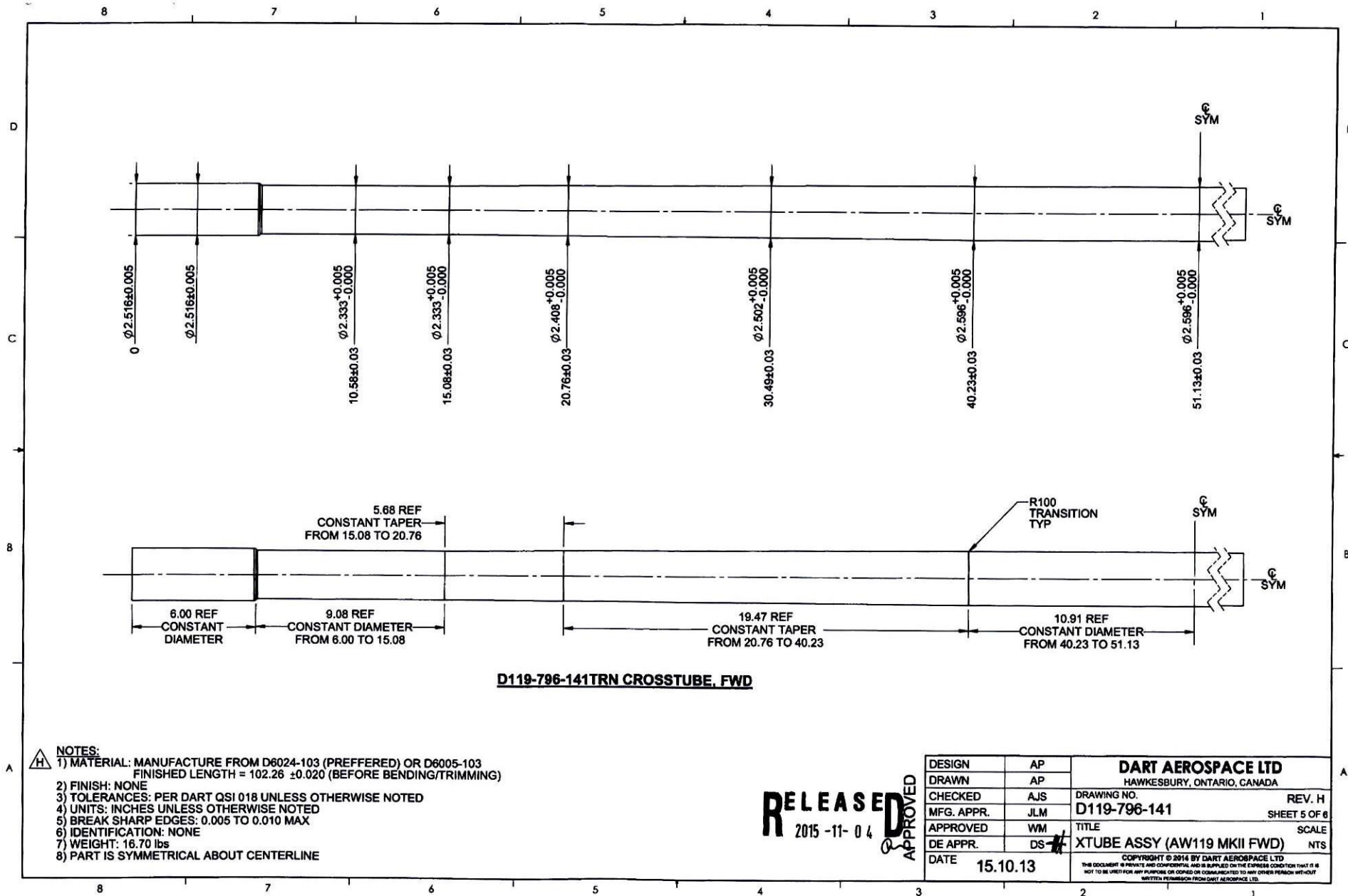
VIEW E-E
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2015-11-04

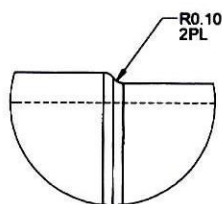
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8 7 6 5 4 3 2 1



D119-796-141TRN CROSSTUBE, FWD
 SUPPLEMENTAL VIEW: NOMINAL WALL THICKNESS



DETAIL F
 SCALE 2X

DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	AP		
CHECKED	AJS	DRAWING NO.	REV. H
MFG. APPR.	JLM	D119-796-141	SHEET 6 OF 6
APPROVED	WM	TITLE	SCALE
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RELEASED
 2015-11-04

APPROVED

CHAMFER ID
 AS REQUIRED
 FOR TOOLING

F

C
 SYM

C
 SYM

0.258 REF
 NOMINAL WALL

10.58±0.03
 0.167 REF
 NOMINAL WALL

15.08±0.03
 0.167 REF
 NOMINAL WALL

20.76±0.03
 0.204 REF
 NOMINAL WALL

30.49±0.03
 0.251 REF
 NOMINAL WALL

40.23±0.03
 0.298 REF
 NOMINAL WALL

51.13±0.03
 0.298 REF
 NOMINAL WALL



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO37609**

Purchase Order Date 8/30/2017

PO Print Date 9/5/2017

Page Number 5 of 6

Order From :

VC-SKY001

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via: Delivered

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax # 10127-2607

Terms Net 30

Currency CAD

FOB FCA - (Free Carrier)

11	165467	D119-796-141 CROSSTUBE	9/7/2017	1.00	\$0.00	\$0.00
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Yes
9/7/2017

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$0.00

12	162476	D119-796-141 CROSSTUBE	9/7/2017	1.00	\$0.00	\$0.00
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Yes
9/7/2017

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

Line Total: \$0.00

13	162475	D119-796-141 CROSSTUBE	9/7/2017	1.00	\$0.00	\$0.00
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Yes
9/7/2017

LIQUID PENETRANT INSPECTION AS PER QSI 038 OR
LPI AS PER ASTM 1417 LEVEL 2

817-9-5

Note:

9/5/2017

**skyservice****Work Order Traveler**
Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO33139	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO37609
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON 12 CROSSTUBES AS PER PO37609

4 FWD CROSSTUBES , ITEM ID# D206-667-107BL , W/O ID# 164159, 164160, 164161, 164162

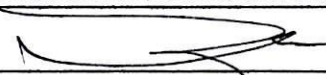
4 AFT CROSSTUBES , ITEM ID# D206-667-207BL , W/O ID# 164176, 164177, 164178, 164179

4 FWD CROSSTUBES , ITEM ID# D119-796-141 , W/O ID# 165466, 165467, 162475, 162476

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13 ***NO CRACK FOUND*** PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , EMU. MPO15896, DEV. MPO11715 , UV LIGHT M-20142						SEP 01 2017	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

SP17-9-5.

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: SEP 01 2017
Name: RAFIK MELIKIAN		